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Typification and taxonomy of *Caloplaca aurantia*

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Abstract — The sample from the Arnold's Lichenes Exsiccati no 989: *Physcia aurantia*, deposited in M, is designated to serve as neotype of *Caloplaca aurantia*. The sample appears to be a topotype of *C. aurantia*. An overview is presented of the complicated history of the application and misuse of the name. Old literature references to *C. aurantia* should be confirmed by herbarium material, since the species was often confused with *C. flavescens*.

Key words — central Europe, lichenized fungi, lichens, *Teloschistales*

Introduction

Caloplaca aurantia belongs to a small group of lobate, saxicolous species unique within the large genus *Caloplaca* (*Teloschistales*, lichenized *Ascomycota*) on account of their lemon-shaped ascospores. The group also includes *C. aegaea* Sipman, *C. flavescens* (Huds.) J.R. Laundon, *C. fuerteventurae* van den Boom & Etayo and *C. thallincola* (Wedd.) Du Rietz. Despite several recent taxonomic treatments including these species (Nordin 1972, Wetmore & Kärnefelt 1998, Gaya 2009), *C. aurantia* remains the only taxon that has not been typified. Moreover, although the name *C. aurantia* is used unambiguously in recent literature, I have noticed that its intricate evolution since the 18th century sometimes causes confusion even today (Šoun & Vondrák 2008). Here I select a type and discuss the historical circumstances associated with this name.

Typification

Caloplaca aurantia (Pers.) J. Steiner, Sitzungsber. Kaiserl. Akad. Wiss. Wien, Math.-Naturwiss. Cl., Abt. 1, 105: 438, 1896

≡ *Lichen aurantius* Pers., Ann. Bot. (Usteri) 11: 14, 1794

Type – An Kalkfelsen beim Dorfe Wendershausen unweit Witzenhausen an der Werra [Germany, Hesse], 1883, Dannenberg [Arnold's Lichenes Exsiccati no 989 sub *Physcia aurantia*, M (M-0127045)! – **neotype designated here**; PRM! – isoneotype].

≡ *Physcia aurantia* (Pers.) Arnold, Flora 67: 246, 1884

≡ *Caloplaca callopisma* [unranked] *aurantia* (Pers.) Hellb., Bih. K. Svenska Vet.-Akad. Handl., Afd. 3, 16(1): 60, 1890 [as "*Caloplaca callopisma* * *C. aurantia*"]

≡ *Amphiloma aurantium* (Pers.) Müll. Arg., Hedwigia 31: 153, 1892

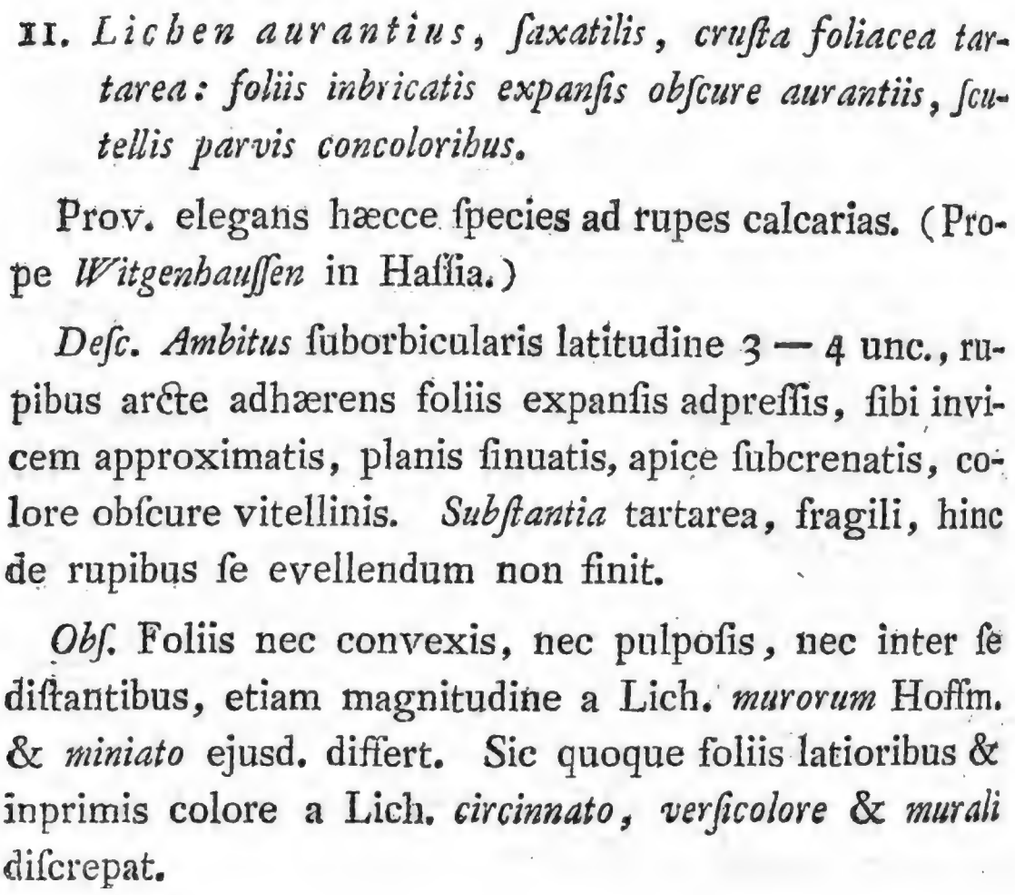
= *Lichen sympageus* Ach., Lichenogr. Suec. Prodr.: 105, 1798

= *Lecanora callopisma* Ach., Lichenogr. Univ.: 437, 1810

Type – in muris et saxis Galliae [France], Dufour (H-Ach #1163A!, lectotype selected by Wetmore 1998).

= *Callopisma vulgaris* De Not., Giorn. Botan. Ital., anno 2, tomo 2: 199, 1847

Caloplaca aurantia was described as *Lichen aurantius* by Persoon (1794). However, there is no specimen named *Lichen aurantius* present in Persoon's herbarium in L (Nordin 1972, G. Thijsse in litt. 2005). Despite the absence of a type specimen, however, the protologue (Fig. 1) is sufficiently detailed to lead one to a proper identification of *C. aurantia* according to current concepts. Any confusion with the potentially most similar species, *C. flavescens,* is avoided by the reference to flat, non-convex lobes. Arnold's Lichenes Exsiccati no 989 of *Physcia aurantia* was collected in 1883 by Dannenberg, most likely at the type locality. The exsiccate was distributed according to Grummann (1974) to C, DUKE, FH, FR, GOET, H, HAL, HSI, K, L, M, NY, O, PC, S, UPS, US, and W;



II. *Lichen aurantius, ſaxatilis, cruſta foliacea tartarea: foliis imbricatis expanſis obſcure aurantiis, ſcutellis parvis concoloribus.*

Prov. elegans hæcce ſpecies ad rupes calcarias. (Prope *Witgenhauſſen* in Haſſia.)

Deſc. Ambitus ſuborbicularis latitudine 3 — 4 unc., rupibus arcte adhærens foliis expanſis adpreſſis, ſibi invicem approximatis, planis ſinuatis, apice ſubcrenatis, colore obſcure vitellinis. *Subſtantia* tartarea, fragili, hinc de rupibus ſe evellendum non finit.

Obſ. Foliis nec convexis, nec pulpoſis, nec inter ſe diſtantibus, etiam magnitudine a Lich. *murorum* Hoffm. & *miniato* ejusd. differt. Sic quoque foliis latioribus & inprimis colore a Lich. *circinnato, verſicolore* & *murali* diſcrepat.

Fig. 1. The original description of *Lichen aurantius* (Persoon 1794: 14).

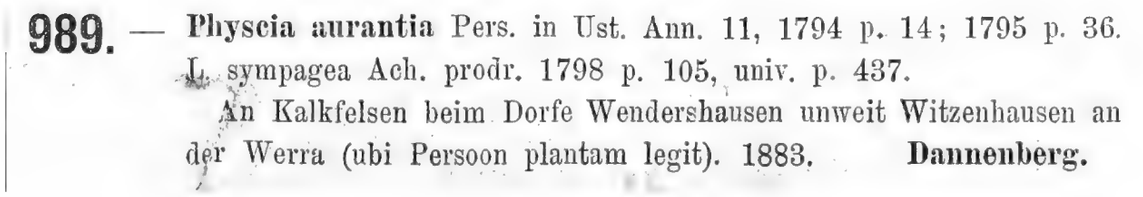

989. — **Physcia aurantia** Pers. in Ust. Ann. 11, 1794 p. 14; 1795 p. 36.
L. sympagea Ach. prodr. 1798 p. 105, univ. p. 437.
An Kalkfelsen beim Dorfe Wendershausen unweit Witzenhausen an der Werra (ubi Persoon plantam legit). 1883. **Dannenberg.**

FIG. 2. The label of Arnold's Lichenes Exsiccati no 989 of *Physcia aurantia* (M).

I have also found one in PRM. On the label (FIG. 2) it is claimed that the locality [the village of Wendershausen near Witzenhausen on the Werra] corresponds with Persoon's protologue [at Witgenhaussen in Hassia], so this exsiccate specimen is regarded as a topotype. The locality is situated in the northern part of current German state of Hesse, and in Persoon's protologue Witgenhaussen is very probably incorrectly spelled Witzenhausen. Arnold's exsiccate agrees well with Persoon's description — especially in its flat, deep orange lobes — while at the same time corresponding to the modern concept of *C. aurantia*; among other characters, the absence of a crystalline layer in the cortex distinguishes it from *C. flavescens*. For some reason, however, Arnold issued this collection as *Physcia aurantia*, a name that he usually misapplied to *C. flavescens*, instead of *Physcia callopisma* (Ach.) A. Massal., the name that he normally used for the true *C. aurantia* (Arnold 1884). I select here this exsiccate in M as the neotype of *C. aurantia*.

Development of taxonomy

The name *Lichen aurantius* introduced by Persoon (1794) was soon synonymized by Acharius (1798: 105) with a new name, *Lichen sympageus*. Acharius, however, had never seen Persoon's *L. aurantius*, as he himself noted; he likely just excerpted Persoon's original description and also the short note in a further Persoon publication (Persoon 1795). Fries (1871) later also pointed out that Acharius had never seen *L. sympageus* and that the species is absent from Acharius's herbarium. Although by citing an older synonym in the protologue Acharius made the name *L. sympageus* superfluous and illegitimate, it was adopted by some authors. Later, Acharius (1803) incorrectly reduced both *L. sympageus* and *L. aurantius* to synonymy with *Parmelia elegans* (Link) Ach. [≡ *Xanthoria elegans* (Link) Th. Fr.].

In 1810, Acharius adopted yet another concept. On the basis of specimens from different sites in Europe, he described *Lecanora callopisma* (= *C. aurantia*) with *Lichen sympageus* treated as its variety (*Lecanora callopisma* β *sympagea*) that differed only in its more strongly orange thallus color (Acharius 1810). During the 19th century various authors treated *L. callopisma* also under other genera, reflecting the evolution in taxonomy: *Aglaopisma vulgaris* (De Not.) De Not., *Amphiloma callopisma* (Ach.) Körb., *Callopisma vulgaris*, *Gasparrinia*

callopisma (Ach.) P. Syd., *Parmelia callopisma* (Ach.) Hepp, *Physcia callopisma*, *Placodium callopismum* (Ach.) Mérat, *Teloschistes callopismus* (Ach.) Trevis., and *Xanthoria callopisma* (Ach.) Th. Fr. Fries (1871) combined *Lecanora callopisma* into the currently accepted genus *Caloplaca*, however he included under this name also lichens from southern Scandinavia known today as *C. flavescens*; nevertheless some authors followed suit (e.g. Hellbom 1890).

Arnold (1881) stated that, in his opinion, *Lichen aurantius* is the oldest name for *Amphiloma heppianum* Müll. Arg. (= *C. flavescens*) described by Müller (1862). He probably based his opinion on specimens of *C. flavescens* that he saw in Meyer's herbarium determined as *L. callopisma* var. *aurantia* or *L. callopisma* var. *sympagea*. Subsequently Arnold (1884) incorrectly replaced the name *Physcia heppiana* (Müll. Arg.) Arnold with *Physcia aurantia* and this was probably the starting point for the misapplication of the epithet *aurantia* for next c. 70 years. Disagreeing with his concept, some authors (e.g. Hue 1886, Crombie 1894, Nylander 1896, Monguillon 1899) used Acharius's epithet *sympagea* for *Physcia heppiana.* From the end of 19th to the beginning of 20th century, three epithets (*aurantium*, *heppianum* and *sympageum*) were in use simultaneously for *C. flavescens* and two for *C. aurantia* (*aurantium* and *callopismum*; e.g., Flagey 1886, Sydow 1887, Hue 1896 and Nylander 1896).

As Nordin (1972) has noted, Hellbom's combination of *Caloplaca callopisma* * *aurantia* (Hellbom 1890: 60) does not refer to the correct material but is misapplied to *C. flavescens.* Steiner's later combination of *Caloplaca aurantia* (Steiner 1896: 438) probably refers to the correct lichen. The combination *C. aurantia* has been attributed to both Hellbom and Steiner, but as Laundon (1984) has indicated, only Steiner's combination is at species rank; the Hellbom combination is at an undesignated infraspecific rank, as indicated by the typography and explicitly stated in discussion (Hellbom 1890: 60–62).

Müller's combination of *Amphiloma aurantium* is worth mentioning because it was the first to correctly synonymize *L. aurantius* with *L. callopisma* (Müller 1892). This concept was subsequently adopted by some, but not all, lichenologists (e.g. Hue 1896, Rieber 1901, Migula 1929) in the first half of 20th century. Unfortunately Zahlbruckner (1931) also treated *C. aurantia* incorrectly as *C. heppiana* (Müll. Arg.) Zahlbr. (= *C. flavescens*).

After Poelt (1954) the species and names *C. aurantia* and *C. flavescens* (until Laundon 1984 as *C. heppiana*) have been used correctly in general, although some authors initially used these names for two different varieties within *C. aurantia* (Poelt 1954, 1969, Wade 1956, Alon & Galun 1971). Only a few authors persisted in using Zahlbruckner's concept after 1954 (e.g. Moruzi et al. 1967 and Werner 1956).

The intricate history of the application of the name *C. aurantia* means that all old literature references to this species require confirmation by herbarium

material, because some records obviously represent a different species, *C. flavescens*.

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